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Research Letter

The Impact of the Coronavirus Disease-2019 Pandemic and Italian Lockdown Measures on Clinical Presentation and Management of Acute Heart Failure

To the Editor:

Coronavirus disease-2019 (COVID-19) has rapidly evolved into a pandemic with a major impact on worldwide health.[1] As of April 21, 2020, approximately 183,957 cases of COVID-19 and 24,648 deaths have been confirmed in Italy.[2] Following the COVID-19 outbreak at the end of February 2020, the Italian government implemented extraordinary measures to minimize the spread of infection.[3] We describe the impact of the current COVID-19 pandemic and the consequent Italian lockdown measures on the clinical presentation and management of acute heart failure (AHF) in patients without COVID-19.

Methods

We analyzed the clinical records of consecutive patients reporting to the emergency department (ED) of San Filippo Neri Hospital in Rome, Italy, for AHF between February 20 and April 20, 2020. All patients with evidence of COVID-19 were excluded. Collected data were compared with those of patients with AHF reporting to the same ED between February 20 and April 20, 2019. A diagnosis of AHF was made according to European Society of Cardiology criteria.[4] The local ethics committee had previously authorized the collection of anonymous data from patients with AHF.

Group differences for continuous data were examined by unpaired Student *t* test or by Mann-Whitney 2-sample test, as appropriate. For categorical variables, group differences were examined by χ^2 or Fisher exact test, as appropriate. A stepwise logistic regression analysis was performed. The model was built using variables that showed a *P*value of less than .10 in univariate analysis. The significance within the model was evaluated with the Wald statistical test. A 2-sided *P*value of less than .05 was considered significant.

Results

After the COVID-19 outbreak, the number of ED visits was 2711, vs. 6060 in 2019 (a 55% decrease). The number of patients with AHF decreased by 49%, from 127 to 64 (Table 1). Patients with AHF during the pandemic were older, more frequently male, and with worsening rather than new-onset heart failure requiring admission to the intensive care unit. These patients also showed a higher prevalence of atrial fibrillation, ischemic heart disease, diabetes mellitus, severe renal dysfunction, and reduced ventricular function. In-hospital all-cause mortality for was 17.2% in 2020 and 6.3% in 2019, with an odds ratio of 3.1 (95% confidence interval [CI], 1.1−8.1; $P = .022$).

The following features were independent predictors of in-hospital mortality: age (hazard ratio [HR] per 5-year increase: 1.3; 95% CI, 1.1−1.8; $P = .002$); admission to intensive care unit (HR, 2.1; 95% CI, 1.7−3.4; $P = .001$); systolic blood pressure of less than 100 mm Hg on admission (HR, 1.7; 95% CI, 1.2−2.7; $P = .03$); admission during the COVID-19 pandemic (HR, 2.7; 95% CI, 1.2−6.9; $P = .01$).

Discussion

The COVID-19 outbreak in Italy has been associated with a 40%−60% decrease in ED visits,[5,6] with similar trends observed in other countries.[7] Our study confirms that the COVID-19 pandemic led to a decrease in overall ED visits, paired with a 49% decrease in patients with AHF. The AHF cohort without COVID-19 presenting to the ED during the pandemic had a higher prevalence of high-risk features and in-hospital mortality. Presentation owing to AHF during the pandemic was an independent predictor of in-hospital mortality in patients without COVID-19.

Patients with heart disease who contract COVID-19 are considered at higher risk of worse outcomes and advised to be extremely careful.[8] Consequently, these patients may avoid hospitals and seek alternative management. Previous reports have highlighted areas of concern for patients requiring cardiac care during the COVID-19 outbreak, including delays in presentation and treatment.[9] Our study shows that, during the COVID-19 pandemic, patients with AHF often reported to the ED after significant clinical deterioration, possibly owing to several different barriers to appropriate care. Primary care services have been overwhelmed by COVID-19 cases, making it difficult to manage other health care needs, including the worsening of chronic conditions such as AHF.[3,6] It would be important to know how patients with AHF were managed at home and their outcomes. However, these issues are beyond the scope of the current study. Patients with AHF may have been left without proper guidance that would have directed them to EDs sooner. The COVID-19 pandemic has disrupted most consolidated approaches to heart disease management, including AHF.[6,9] Stakeholders should be aware that the risks of delayed access to hospital care for AHF could be even higher than those posed by COVID-19. Moreover, a

Table 1. Clinical Characteristics of AHF Patients Reporting to the ED

	February 20 to April 20, 2019	February 20 to April 20, 2020	*P* Value
Total ED visits	6060	2711	
AHF patients	127 (2.1)	64 (2.3)	NS
Age , years	73 ± 8	78 ± 9	<.001
Males	72 (57)	51 (79)	.003
De novo AHF	50 (39)	12 (18)	.005
Worsening AHF	77 (61)	52 (82)	.005
Admission to ICU	31 (24)	29 (45)	.005
SBP <100 mm Hg on admission	18 (14)	21 (32)	.004
Ischemic heart disease	68 (53)	49 (76)	.002
Atrial fibrillation	47 (37)	39 (61)	.002
Diabetes mellitus	43 (33)	32 (50)	.023
BNP on admission, pg/mL	640 ± 138	874 ± 261	<.001
eGFR <30 mL/min/1.73 m^2	29 (23)	38 (59)	<.001
LVEF <40%	81 (64)	57 (89)	<.001

Values are mean ± standard deviation or number (%).

AHF, acute heart failure; BNP, brain natriuretic peptide; ED, emergency department; eGFR, estimated glomerular filtration rate; ICU, intensive care unit; LVEF, left ventricular ejection fraction; SBP, systolic blood pressure.

significant reengineering of health care services should be considered. The implementation of modern communication systems may overcome several emerging problems in the post-COVID-19 era.[10] Online real−time consultations with primary care physicians and specialists may effectively circumvent the need for patient travel.

Disclosures

None.

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.cardfail.2020.05.007.

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https://doi.org/10.1016/j.cardfail.2020.05.007